In re patent application of:
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USSN 10/733,939
For: Apparatus and Method for Electrostatic
Spraying of Conductive Coating Materials

I. Amendments to the Claims

Please amend the claims as follows:

1. (Currently amended) Apparatus for isolating an electrostatic sprayer from an electrically grounded coating product distribution circuit connected thereto, the apparatus comprising:

an electrostatic sprayer carried by a maneuverable robot arm, the sprayer capable of spraying an electrically conductive coating product onto a workpiece passing in adjacent proximity thereby on command,

said coating product being supplied from a source of supply through at least one distribution circuit connected to said sprayer,

said distribution circuit including therein, and carried by said robot arm, an electrically insulative storage tank for said coating product in valved fluid communication with said sprayer and connected to and positioned downstream from a length of electrically insulative supply conduit,

said length of supply conduit also carried by said robot arm and including

means for cleaning a portion, including all, of said length of supply conduit, in situ, after filling of said storage tank with coating product and before spraying, such that substantially all of said conductive coating product is removed from said portion of supply conduit, thereby isolating said sprayer electrically from said distribution circuit, wherein containment and storage of said coating product prior to spraying are effected within a deformable membrane housed within said storage tank.

2. (Original) The apparatus of claim 1 wherein said storage tank and supply conduit are formed within a unitary housing.

3. (Original) The apparatus of claim 1 wherein said supply conduit is formed of polyacetal resin.

4. (Original) The apparatus of claim 2 wherein said housing is formed of polyacetal resin.

5. (Cancelled)

6. (Currently Amended) The apparatus of claim [[5]] 1 wherein spraying is effected by metered pump means positioned downstream of said storage tank and upstream from said sprayer.

7. (Original) The apparatus of claim 6 wherein said pump means is a gear pump.

8. (Currently Amended) The apparatus of claim [[5]] 1 wherein said membrane is made of an elastomer.

9. (Original) The apparatus of claim 8 wherein said elastomer is a fluoroelastomer.

10. (Original) The apparatus of claim 9 wherein said elastomer is a fluorinated ethylene propylene (FEP) elastomer.

11. (Original) The apparatus of claim 9 wherein said elastomer is a perfluoroalkyl (PFA) elastomer.

12. (Cancelled)

13. (Original) The apparatus of claim 1 wherein containment and storage of said coating product is effected within a balloon-like chamber housed within said storage tank prior to spraying.

14. (Original) The apparatus of claim 1 wherein said supply conduit is tubular.

15. (Original) The apparatus of claim 14 wherein said means for cleaning said supply conduit includes a plunger positioned within said conduit and adapted to reciprocally traverse said length of said conduit.

16. (Original) The apparatus of claim 15 wherein said plunger is made of a fluoroelastomer.

17. (Original) The apparatus of claim 15 including driving means for driving said plunger reciprocally back-and-forth through said length of said conduit on command.

18. (Original) The apparatus of claim 17 wherein said driving means comprises air under pressure controlled by valving.

19. (Original) The apparatus of claim 18 having a valve-controlled source of compressed air connected thereto.

20. (Original) The apparatus of claim 1 including a valve-controlled source of solvent connected to said distribution circuit.

21. (Original) The apparatus of claim 20 wherein said solvent is water.

22. (Original) The apparatus of claim 21 wherein said solvent is de-ionized water.

23. (Original) The apparatus of claim 1 including a high voltage generator carried within said robot arm, said generator being supplied with low voltage via an isolated connector from an external voltage source.

24. (Original) The apparatus of claim 1 connected to a plurality of coating product distribution circuits, said circuits optionally distributing coatings of different colors.

25. (Original) The apparatus of claim 1 connected to a source of water-based paint.

26. (Original) An installation for coating a plurality of work-pieces simultaneously, said installation including a plurality of the apparatus of claim 1 connected to a plurality of coating product distribution circuits.

27. (Original) The apparatus of claim 1 wherein said work-piece is an automotive vehicle.

28. (Original) The apparatus of claim 26 wherein said work-pieces are automotive vehicles.

29. (Original) Apparatus for isolating an electrostatic sprayer from an electrically grounded, water-based paint distribution circuit connected thereto, the apparatus comprising:

an electrostatic spray applicator carried by a maneuverable robot arm, the applicator capable of spraying water-based paint onto an automotive vehicle passing in adjacent proximity thereby on command,

said paint being supplied from a paint source through at least one grounded distribution circuit connected to said applicator,

said distribution circuit including therein, and carried by said robot arm, an electrically insulative storage tank for said paint in valved fluid communication with said applicator and connected to and positioned downstream from a length of electrically insulative supply conduit,

said length of supply conduit also being carried by the robot arm and including

plunger means for cleaning a portion, including all, of said length of supply conduit, in situ, after filling of said storage tank with water-based paint and before spraying, such that substantially all of said conductive paint is removed from said portion of supply conduit, thereby isolating said applicator from said distribution circuit, wherein

said storage tank and supply conduit are formed within a unitary housing, all made of polyacetal resin, and

containment and storage of the paint prior to spraying is effected within a deformable membrane of a fluorinated ethylene propylene (FEP) elastomer, and

said supply conduit is tubular having a plunger of a fluoroelastomer positioned therein and adapted to reciprocally traverse said length of said conduit, and including a

valve-controlled source of compressed air connected thereto providing valve-controlled driving means for driving said plunger reciprocally back-and-forth through said conduit on command.

30. (Original) An installation for painting a plurality of automotive vehicles simultaneously, including a plurality of the apparatus of claim 29 connected to a plurality of water-based paint distribution circuits.

31 - 58. (Cancelled)